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Signature: *Suzanne Shadley* Date: *2/8/02*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Guan, S. et al.	
Serial No.:	To Be Assigned	Group Art Unit: Not Yet Assigned
Filed:	Even Date Herewith	
For:	Apparatus For Screening Catalysts In A Parallel Fixed Bed Reactor (After Amendment)	Examiner: Not Yet Assigned

Assistant Commissioner Of Patents
Washington, D.C. 202231

PRELIMINARY AMENDMENT A

Sir:

Please enter this Amendment A prior to consideration of the above-referenced application:

IN THE SPECIFICATION

At page 1, line 1, please change the title to -- Apparatus for Screening Catalysts in a Parallel Fixed-Bed Reactor -- .

At page 1, line 2, please insert the following paragraph:

-- This application is a divisional of co-pending U.S. Ser. No. 09/607,535, which itself is a divisional of U.S. Ser. No. 09/093,870 filed June 9, 1998 and issued as U.S. Patent No. 6,149,992. --

IN THE CLAIMS

Please cancel claims 1-60 and add new claims 61-88 as follows. Appendix A summarizes the changes made to the claims.

-- 61. An apparatus for evaluating catalytic performance of members of a catalyst library, the apparatus comprising

a reaction vessel assembly comprising a plurality of reaction vessels adapted for receiving catalyst library members, each of the plurality of vessels having an inlet and an outlet;

a fluid handling system for providing fluid flow simultaneously through the plurality of vessels; and

a detector for analyzing vessel effluent,

the fluid handling system comprising an entrance control volume in fluid communication with the inlet of each of the plurality of vessels, a plurality of flow restrictors, and an exit control volume in fluid communication with the outlet of each of the plurality of vessels, each of the plurality of flow restrictors being other than a flow controller and being arranged upstream of one of the plurality of vessels such that each of the plurality of flow restrictors provides fluid communication between one of the plurality of vessels and the entrance control volume, and wherein maintaining a pressure in the entrance control volume higher than in the exit control volume results in fluid flow through the vessels,

the flow restrictors being adapted such that the resistance to fluid flow is greatest in the flow restrictors and the resistance to fluid flow in each of the flow restrictors is approximately the same so that fluid flow through

the vessels is apportioned approximately equally between each of the plurality of vessels.

62. An apparatus for evaluating catalytic performance of members of a catalyst library, the apparatus comprising

a reaction vessel assembly comprising a plurality of reaction vessels adapted for receiving catalyst library members, each of the plurality of vessels having an inlet and an outlet;

a fluid handling system for providing fluid flow simultaneously through the plurality of vessels; and

a detector for analyzing vessel effluent,

the fluid handling system comprising an entrance control volume in fluid communication with the inlet of each of the plurality of vessels, a plurality of flow restrictors, and an exit control volume in fluid communication with the outlet of each of the plurality of vessels, each of the plurality of flow restrictors being one of capillary tubes, or micromachined channels and being arranged upstream or downstream of one of the plurality of vessels, and wherein each of the plurality of flow restrictors provides fluid communication between one of the plurality of vessels and the entrance control volume or the exit control volume, and wherein maintaining a pressure in the entrance control volume higher than in the exit control volume results in fluid flow through the vessels,

the flow restrictors being adapted such that the resistance to fluid flow is greatest in the flow restrictors and the resistance to fluid flow in each of the flow restrictors is approximately the same so that fluid flow through

the vessels is apportioned approximately equally between each of the plurality of vessels.

63. An apparatus for evaluating catalytic performance of members of a catalyst library, the apparatus comprising

a reaction vessel assembly comprising a plurality of reaction vessels for receiving library members, each of the plurality of vessels having an inlet and an outlet;

a fluid handling system for providing fluid flow simultaneously through the plurality of vessels; and

a detector for simultaneously analyzing vessel effluents of at least two of the plurality of vessels,

the fluid handling system comprising an entrance control volume in fluid communication with the inlet of each of the plurality of vessels, a plurality of flow restrictors, and an exit control volume in fluid communication with the outlet of each of the plurality of vessels, each of the plurality of flow restrictors being other than a flow controller and being arranged upstream or downstream of one of the plurality of vessels, and wherein each of the plurality of flow restrictors provides fluid communication between one of the plurality of vessels and the entrance control volume or the exit control volume, and wherein maintaining a pressure in the entrance control volume higher than in the exit control volume results in fluid flow through the vessels,

the flow restrictors being adapted such that the resistance to fluid flow is greatest in the flow restrictors and the resistance to fluid flow in each of the flow restrictors is approximately the same so that fluid flow through

the vessels is apportioned approximately equally between each of the plurality of vessels.

64. The apparatus of claims 61 or 62 further comprising a sampling probe selectively positionable to sample vessel effluent and adapted to transport the sampled fluid to the detector.
65. The apparatus of claim 63 further comprising sampling probes positionable to simultaneously sample vessel effluents of the at least two of the plurality of vessels and adapted to transport the sampled fluids to the detector for simultaneous analysis.
66. The apparatus of claims 61 or 62 wherein the fluid handling system further comprises a selection valve providing selective fluid communication between the outlet of a selected vessel and the detector, such that a test fluid can be sequentially directed from the selected vessel to the detector.
67. The apparatus of claims 61 or 62 wherein the fluid handling system further comprises
- a plurality of outlet conduits and a selection valve, the outlet conduits providing fluid communication between the outlet of each of the plurality of vessels and the selection valve,
- a sample bypass and a sampling valve, the sample bypass providing fluid communication between the selection valve and the sampling valve, and
- a return line providing fluid communication between the sampling valve and the exit control volume,

the selection valve being adapted to divert fluid from a selected vessel to the sample bypass while allowing fluid from non-selected vessels to flow to the exit control volume,

the sampling valve being adapted to provide selective fluid communication between the sample bypass and the return line, and between the sample bypass and the detector.

68. The apparatus of claim 62 wherein the fluid handling system further comprises a fluid distribution valve providing selective fluid communication between the entrance control volume and the inlet of a selected vessel, such that a test fluid can be sequentially directed into the selected vessel.
69. The apparatus of claim 68, wherein the fluid handling system further comprises a selection valve providing selective fluid communication between a selected vessel and the detector, such that a test fluid can be sequentially directed from the selected vessel to the detector.
70. The apparatus of any of claims 61, 62 or 63 wherein the assembly of reaction vessels comprises a base block and a cover block removably attached to the base block.
71. The apparatus of claim 70 wherein the base block includes a top surface having a plurality of wells formed thereon, the cover block includes a bottom surface disposed on the top surface of the base block and having a plurality of depressions formed thereon, each of the plurality of depressions being in substantial alignment with one of the wells, such that the aligned depressions and wells form cavities for containing the vessels.

72. The apparatus of claim 70 wherein the assembly for containing the vessels further comprises inlet ports and outlet ports located on the bottom surface of the base block, each of the inlet ports providing fluid communication with the inlet of only one of the vessels, each of the outlet ports providing fluid communication with the outlet of only one of the vessels.
73. The apparatus of claim 70 wherein the assembly for containing the vessels further comprises an inlet port located on the bottom surface of the base block, and outlet ports located on the top surface of the cover block, the inlet port providing fluid communication with an entrance control volume that provides fluid communication with the inlets of the vessels, each of the vessel outlet ports providing fluid communication with the outlet of only one of the vessels.
74. The apparatus of any of claims 61, 62 or 63 further comprising a pressure regulator in the entrance control volume, or in both of the entrance control volume and the exit control volume.
75. The apparatus of any of claims 61, 62 or 63 wherein the fluid handling system further comprises flow regulators.
76. The apparatus of any of claims 62 or 63 wherein each of the plurality of flow restrictors provide fluid communication between the entrance control volume and one of the plurality of vessels.
77. The apparatus of any of claims 62 or 63 wherein each of the plurality of flow restrictors provide fluid communication between one of the plurality of vessels and the exit control volume.

78. The apparatus of any of claims 61, 62 or 63 wherein the flow restrictors are capillary tubes.
79. The apparatus of any of claims 61, 62 or 63 wherein the flow restrictors are micromachined channels.
80. The apparatus of any of claims 61, 62 or 63 wherein the fluid handling system is a gas handling system for providing gaseous flow simultaneously through the plurality of vessels.
81. The apparatus of any of claims 61, 62 or 63 wherein the fluid handling system is a liquid handling system for providing liquid flow simultaneously through the plurality of vessels.
82. The apparatus of any of claims 61, 62 or 63 further comprising a system for regulating the temperature of each of the plurality of vessels.
83. The apparatus of any of claims 61, 62 or 63 wherein the detector is selected from the group consisting of a gas chromatograph, a mass spectrometer, a visible spectrometer, an ultraviolet spectrometer and an infrared spectrometer.
84. The apparatus of any of claims 61, 62 or 63 wherein the plurality of vessels comprises six vessels and the plurality of flow restrictors comprises six flow restrictors.
85. The apparatus of any of claims 61, 62 or 63 wherein the plurality of vessels comprises forty-eight vessels and the plurality of flow restrictors comprises forty-eight flow restrictors.
86. The apparatus of any of claims 61, 62 or 63 further comprising a catalyst in each of the plurality of vessels.

87. The apparatus of any one of claims 61, 62 or 63 further comprising a different catalyst in each of the plurality of reaction vessels.
88. The apparatus of any one of claims 61, 62 or 63 wherein the reaction vessels comprise fixed beds of different solid catalyst library members. --

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REMARKS

Claims 61-88 are now pending. The Applicant respectfully requests examination of the new claims presented herewith.

The Examiner is hereby authorized to charge fees required under 37 CFR 1.16(a), (b), (c) and (d) to Deposit Account No. 50-0496. The Examiner is also authorized to charge any other payments due or to credit any overpayments relating to this application to Deposit Account No. 50-0496.

Respectfully submitted,



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Feb. 8, 2002

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APPENDIX A

**MARKED UP VERSION INDICATING AMENDMENTS TO THE SPECIFICATION AND
CLAIMS, AND INDICATING NEW OR CANCELLED CLAIMS**

IN THE SPECIFICATION

*** Changes to the title, at page 1, line 1 are as follows:

Apparatus [Method] for Screening Catalysts in a Parallel Fixed-Bed Reactor

*** A new paragraph has been added at page 1, line 2:

This application is a divisional of co-pending U.S. Ser. No. 09/607,535, which itself is a
divisional of U.S. Ser. No. 09/093,870 filed June 9, 1998 and issued as U.S. Patent No.
6,149,992. --

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*** Changes to the claims are as follows:

Claims 1-60 are cancelled.

Claims 61-88 are new.